IN THE CLAIMS

Claim 1. (currently amended) A decoding apparatus comprising:

acquiring and equalizing means for acquiring encoded data ~~by~~ and performing a partial-response equalization on the encoded data, which is an information series encoded by a run length limited code having ~~using~~ a first finite state transition diagram, then converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run length limited code;~~ and

means for combined detecting and decoding the ~~acquired~~ equalized encoded data ~~by using~~based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference, the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization~~,~~ ~~said encoded data having been generated by encoding an information series~~;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in ~~the~~ a first finite state transition table; wherein the first finite state transition diagram accords with (2, 7) run length limited code conversion rules.

Claims 2-7. (canceled)

Claim 8. (currently amended) A decoding method comprising the steps of:

acquiring encoded data ~~by~~ and performing a partial-response equalization on the encoded data, which is encoded by a run length limited code having ~~using~~ a first finite state transition diagram, then converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run length limited code;~~ and

combined detecting and decoding the equalized encoded data ~~acquired in the step of acquiring by using~~based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference~~;~~, the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in ~~the~~ a first finite state transition table; wherein the first finite state transition diagram accords with (2, 7) run length limited code conversion rules.

Claim 9. (currently amended) A program storage medium storing a computer-readable program that describes the steps of:

acquiring and equalizing encoded data by performing a partial-response equalization on the encoded data, which is encoded by a run length limited code having ~~using~~ a first finite state transition diagram, converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run length limited code;~~ and

combined detecting and decoding the equalized encoded data ~~acquired in said step of acquiring by using~~ based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference, converted and carried on an intersymbol interference communication path; the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in ~~the~~ a first finite state transition table; wherein the first finite state transition diagram accords with (2, 7) run length limited code conversion rules.

Claim 10. (canceled)

Claim 11. (currently amended) A recording/reproducing apparatus comprising:

encoding and converting means for encoding an information series by a run length limited code with a first finite state transition diagram and ~~in by~~ performing a partial-response equalization conversion on the encoded data ~~using a first finite state transition diagram; wherein the first finite state transition diagram accords with a run length limited code~~;

recording/reproducing means for recording and reproducing data encoded and converted by the encoding and converting means, in and from a recording medium having an intersymbol interference path;

equalizing means for partial-response equalizing the reproduced data; and

combined detecting and decoding means for detecting and decoding the ~~encoded~~ equalized data reproduced ~~by the recording/reproducing means by using~~based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference; the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of

states in ~~the~~ a first finite state transition table; wherein the first finite state transition diagram accords with (2, 7) run length limited code conversion rules.